Design and Evaluation of a Prospective Payment System for Ambulatory Care

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Executive Summary

Introduction

In the Omnibus Budget Reconciliation Act (OBRA) of 1986, Congress directed the Health Care Financing Administration to develop a Prospective Payment System (PPS) for the facility cost of hospital based outpatient care. The Act called for the design and modeling of a PPS for all hospital outpatient services (e.g., same day surgery units, emergency rooms, outpatient clinics, etc.). The facility cost refers to the hospital cost for providing care (e.g., room charges, medical and surgical supplies, etc.) and excludes the physician's professional service.

In April of 1983, Congress enacted legislation to create the Medicare Inpatient Prospective Payment System. The unit of payment for the inpatient system was established as the discharge. Hospital casemix was quantified using the Diagnosis Related Group (DRG) patient classification scheme. Predetermined payment rates were established for patients in each DRG. The DRG payment rates were developed on a base year actual cost, and were trended forward by a hospital market basket price index.

The basic unit of payment for outpatients is a visit. A visit represents a contact between the patient and a health care professional. The visit could be for a procedure, for a medical evaluation or simply for an ancillary service such as a chest x-ray. For each type of visit a prospective price could be established that includes all the routine services (e.g., blood tests, chest x-rays, etc.) associated with the visit. Since the cost of the routine services rendered during a visit is included in the payment for the visit, hospitals would have the financial incentive to control the amount of services rendered.

Characteristics of an Ambulatory Patient Classification System

In order to have a visit based outpatient prospective payment system, it is necessary to develop a patient classification system. An outpatient classification system would serve the same function as the DRGs in the inpatient PPS. The patient classification system provides the basic product definition for the outpatient setting and will have important secondary effects. For example, the DRGs have brought about fundamental changes in management, communications, cost accounting and planning within hospitals. These changes have resulted in improved efficiency in the delivery of inpatient care. The benefits to hospital management that resulted from the adoption of the DRGs would similarly be expected to occur in the outpatient setting. Thus, the selection of an appropriate patient classification system is critical to the success of an outpatient prospective payment system and the achievement of the associated secondary benefits. An ambulatory patient classification system should have the following characteristics.

Comprehensive

The patient classification system must be able to describe every type of patient seen in an outpatient setting. This includes medical patients, patients with a procedure and patients who receive ancillary services only.

Administrative Simplicity

The patient classification system should be administratively straightforward to implement. The number of patient classes should be kept to a reasonable number. A patient classification system containing relatively few patient classes (e.g., fewer than the number of DRGs) will be more easily understood by providers and will ease the administrative burden on both facilities and payors. In addition, the data used to define the patient classes should be compatible with existing billing, data collection, coding, storage and processing practices. Such compatibility will decrease implementation costs, data errors and other administrative problems.

Homogeneous Resource Use

The amount and type of resources (e.g., operating room time, medical surgical supplies, etc.) used to treat patients in each patient class should be homogeneous. If resources used varied widely within a patient class, it would be difficult to develop equitable payment rates. If a facility treated a disproportionate share of either the expensive or inexpensive cases within a patient class then the aggregate payments to that facility might not be appropriate. Further, the facility might be encouraged to treat only the less costly patients within the patient class causing a potential access problem for the complex cases. Thus, a homogeneous pattern of resource use is a critical characteristic of any patient classification system used in a prospective payment system.

Clinically Meaningful

The definition of each patient class should be clinically meaningful. For example, a patient class involving a procedure should, in general, contain only procedures on the same body system, of the same degree of extensiveness and utilizing the same method (e.g., surgical, endoscopic, percutaneous, etc.). The underlying assumption in a prospective payment system is that hospitals will respond to the financial incentives in the system and become more efficient. Clinical meaningfulness is critical since in order to respond effectively, hospitals must communicate the incentives to their medical staffs. A clinically meaningful patient classification system will be more readily accepted by providers and will be more useful as a communications and management tool.

Minimal Opportunities for Upcoding

In the patient classification system, there should be minimal opportunities for providers to assign a patient to a higher paying class through upcoding. A patient classification system with many classes that are based on subtle distinctions would tend to be highly susceptible to upcoding. In general, the patient classes should be as broad and inclusive as possible without sacrificing resource homogeneity or clinical meaningfulness. In addition, there should be minimal opportunities for increasing payment by separately reporting the constituent parts of a procedure.

Flexibility

In a visit based payment system, there are a wide array of options in terms of which ancillary services should be included in the visit payment. The extent to which ancillary services are included in the visit payment is a policy decision. The patient classification system must be flexible enough to accommodate the full range of options for incorporating ancillary services into the visit payment. In addition, the patient classification system should be structured to allow changes in technology and practice patterns to be easily incorporated. The patient classification system should provide a flexible framework that can adapt to such change without requiring a major restructuring of the classification system.

Due to the fundamental role that the patient classification system plays in a prospective payment system, it is essential that the patient classification system possess substantially all of the above characteristics.

Since there was no ambulatory patient classification system that possessed all the required characteristics, it was necessary to develop a new ambulatory patient classification system. The new system is referred to as Ambulatory Patient Groups (APGs) and was designed specifically for use as the basis of payment in an ambulatory prospective payment system.

Overview of APGs

APGs are a patient classification system designed to explain the amount and type of resources used in an ambulatory visit. Patients in each APG have similar clinical characteristics and similar resource use and cost. Similar resource use means that the resources used are relatively constant across the patients within each APG. However, some variation in resource use will remain among the patients in each APG. In other words, the definition of the APG will not be so specific that every patient is identical, but the level of variation in resource use is known and predictable. Thus, while the precise resource use of a particular patient cannot be predicted by knowing the APG of the patient, the average pattern of resource use of a group of patients in an APG can be accurately predicted.

Patients in each APG also have similar clinical characteristics. Similar clinical characteristics mean that the patient characteristics included in the definition of the APG should relate to a common organ system or etiology and that a specific medical specialty should typically provide care to the patient in the APG. In addition, all available patient characteristics which medically would be expected to consistently affect resource use should be included in the definition of the APGs. For example, patients with a chronic stomach ulcer may or may not be hemorrhaging. Although these patients are the same from organ system, etiology and medical specialist perspectives, the APGs will assign these patients to different patient classes, since the presence of hemorrhage would be expected to consistently increase the resource use of chronic stomach ulcer patients. On the other hand, sets of unrelated surgical procedures would not be used to define an APG since there is no medical rationale to substantiate that resource use would be expected to be similar.

The definition of similar clinical characteristics is, of course, dependent on the goal of the classification system. For APGs, the definition of clinical similarity relates to the medical rationale for differences in resource use. If, on the other hand, the classification goal was related to patient prognosis, then the definition of patient characteristics which were clinically similar might be different. The requirement that APGs be clinically homogeneous caused more patient classes to be formed than would be necessary for explaining resource use alone. For example, patients with a D&C or a simple hemorrhoid procedure are quite similar in terms of most measures of resource use. However, different organ systems and different medical specialties are involved. Thus, the requirement that APGs have similar clinical characteristics precludes the possibility of these types of patients being in the same APG.

APGs were developed to encompass the full range of ambulatory settings including same day surgery units, hospital emergency rooms, and outpatient clinics. APGs, however, do not address phone contacts, home visits, nursing home services or inpatient services. While the anticipated initial application of APGs focuses on Medicare patients, APGs were developed to represent ambulatory patients across the entire patient population. For example, APGs relating to pregnancy were developed even though pregnancy is not usually encountered in the Medicare population.

APGs were developed to differentiate facility costs and not professional costs. However, professional costs relate primarily to professional time and, therefore, directly relate to facility time. Professional time can serve as a proxy for the amount of time a patient used the resources of the facility. During the development of APGs, facility costs such as supplies and equipment as well as professional time were taken into consideration.

The data elements used to define APGs were limited to the information routinely collected on the Medicare claim form and consisted of the diagnoses coded in ICD-9-CM, procedures coded in CPT and the age and sex of the patient. The patient characteristics used in the definition of the

APGs were restricted to those readily available in order to insure that the APGs could be readily implemented.

Selection of the Initial Classification Variable

The first step in developing a patient classification system is to choose the initial classification variable. In the DRGs, the principal diagnosis is used to classify patients into a set of mutually exclusive Major Diagnostic Categories (MDCs). Within each MDC, procedure, age and complication and comorbidities are used to complete the DRG classification system, APGs use procedure instead of diagnosis as the initial classification variable. The decision to use procedure as the initial classification variable was based on the following considerations:

- When a significant procedure is performed in an ambulatory setting, it is normally the reason for the visit. The procedure will normally be scheduled in advance and will consume the vast majority of resources associated with the visit.
- With procedure as the initial classification variable, each procedure will be assigned to only one APG. With principal diagnosis as the initial classification variable, the same procedure could be assigned to many different APGs depending on the MDC of the principal diagnosis. Having each procedure in only one APG also reduces the number of APGs and simplifies the establishment of prospective prices.
- There are several Relative Value Unit (RVU) scales available for CPT procedures. With procedure as the primary classification variable, the RVU scales can be used directly in the formation of the initial procedure classes.

Once the decision to use procedure as the initial classification variable was made, it was then necessary to partition all procedures into a set of mutually exclusive and exhaustive procedure groups. The first step in the process was to identify all procedures which could be done only on an inpatient basis. An inpatient procedure was defined as a procedure which requires at least 24 hours of post operative recovery time or monitoring before a patient can be safely discharged. Some procedures, such as craniotomies, are clearly inpatient procedures. However, there are other procedures such as the treatment of an open fracture which would normally be done on an inpatient basis but could sometimes be done on an ambulatory basis. Further, patients with the same CPT procedure code can have a great deal of variation in the complexity of the procedure performed. For example, the treatment of an open humeral fracture can vary considerably in complexity.

Only the simplest cases of procedures normally done on an inpatient basis are done on an ambulatory basis. Thus, an open humeral fracture treated on an ambulatory basis will have minimal bone displacement and tissue damage. Such procedures are included in the APG procedure classification. When grouping procedures together to form homogeneous procedure subclasses, it is important to recognize the variation within a CPT code and that only the simplest cases of complex procedures are treated on an ambulatory basis.

The procedures which could be performed on an ambulatory basis were then assigned to one of the following three classes:

Significant Procedure

A significant procedure is a procedure which is normally scheduled, constitutes the reason for the visit and dominates the time and resources expended during the visit. An example of a significant procedure is the excision of a skin lesion. Also included in significant procedures are significant tests such as a stress test.

Ancillary Tests and Procedures

An ancillary test is a procedure which is ordered by the primary physician to assist in patient diagnosis or treatment. Radiology, laboratory and pathology constitute ancillary tests. An ancillary procedure is a procedure that does increase the time and resources expended during a visit, but does not dominate the time and resources expended during the visit. Examples of ancillary procedures are immunizations, and an insertion of an IUD. The term ancillary services is used to refer to both ancillary tests and ancillary procedures.

Incidental Procedure

An incidental procedure is an integral part of a medical visit and is usually associated with professional services, such as range of motion measurements.

Only patients with a significant procedure are assigned to significant procedure APGs. All medical services provided to the patient are assumed to be an integral part of the procedure. Patients with no significant ambulatory procedures but with only incidental and ancillary procedures are assigned to medical APGs. The tree diagram in Figure 1 illustrates the initial APG partition based on the presence of a significant procedure. For example, if a patient has a skin lesion and has a skin excision performed, the patient will be assigned to a significant procedure APG based on the CPT code that describes the precise procedure. Conversely, if a patient has a skin lesion but does not have a procedure performed, then the patient will be assigned to a medical APG based on the ICD-9-CM diagnosis code.

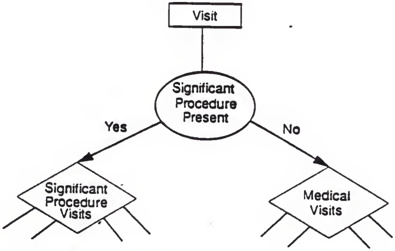

Figure 1 Initial APG Partition Based on the Presence of a Significant Procedure

Development of Significant Procedure APGs

Significant ambulatory procedures are subdivided into groups of CPT codes based on the body systems shown in Table 1. Body systems were formed as the first step toward ensuring that the procedures in each APG were clinically similar. The significant procedures in each body system generally correspond to a single organ system and are associated with a particular medical specialty. The body systems used in the procedure APGs are similar to the MDCs in the DRGs. However, there are some significant differences. For example, the body system for skin and subcutaneous tissue includes muscle, whereas muscle is in the musculoskeletal MDC. Muscle was included in the skin and subcutaneous tissue body system since most procedures involving the fascia (connective tissue) are clinically similar to dermal procedures and have similar patterns of resource use. If fascia or muscle procedures were included within the bone and joint body system then it would have been necessary to form separate APGs for muscle procedures. Thus, the inclusion of muscle in the skin and subcutaneous tissue body system reduced the overall number of APGs.

Body System
Skin, Subcutaneous Tissue and Muscle
Breast
Bone, Joint and Tendon
Respiratory, Mouth, Nose and Throat
Cardiovascular
Hematology, Lymphatic and Endocrine
Digestive
Urinary
Male Reproductive
Female Reproductive
Nervous
Eye
Ear

Table 1 Body Systems Used in Significant Procedure Classification

Some body systems had few procedures performed on an ambulatory basis. For example, except for biopsies or excisions of the thyroid, there are no endocrine procedures performed on an ambulatory basis. Thyroid procedures were included with lymph node biopsies and excisions since they are clinically quite similar. The only respiratory procedures performed on an outpatient basis are upper airway procedures. Thus, respiratory procedures were included in the same body system as throat, mouth and nose procedures. Since there are many different types of ear procedures performed on an ambulatory basis, ear procedures were made a separate body system.

Once each significant procedure was assigned to a body system, the procedures in each body system were subdivided into clinically similar classes. The classification variables considered in the formation of the procedure classes are shown in Table 2. In general, method was used as the primary classification variable. Different methods such as surgery, endoscopy, manipulation, dilation, catheterization, laser and needle often require different types of rooms, equipment and supplies as well as different amounts of time. For example, procedures in the respiratory body system are initially divided by method into surgical, endoscopic, needle or catheter and noninvasive test subgroups. On the other hand, most male reproductive procedures are surgical and, therefore, the male reproductive body system was initially subdivided on site and not method. Surgical procedures were usually subdivided based on type (i.e., an incision, excision, or repair). The time required to perform a procedure depends on the type of procedure, with repairs generally taking the most time. Thus, surgical skin procedures were divided into separate incision, excision and repair groups.

Variable	Example
Site	Face, Hand, etc.
Extent	Excision Size: 2 cm Versus 20 cm
Purpose	Diagnostic or Therapeutic
Type	Incision, Excision or Repair
Method	Surgical, Endoscopic, etc.
Device	Insertion or Removal
Medical Specialty	Urology, Gynecology, etc.
Complexity	Time Needed to Perform Procedure

Table 2 Classification Variables Used to Develop Significant Procedure APGs

Endoscopic procedures were often divided into separate classes depending on purpose (i.e., diagnostic or therapeutic). Therapeutic endoscopic procedures generally require more time. The extent of a procedure was often taken into consideration. Thus, skin excisions of 2 cm and 20 cm are assigned different APGs.

Another aspect of extent is the complexity of the procedure. Complexity basically refers to the amount of time normally required to perform a procedure. For example, the excision of a pressure ulcer will generally require more time than the excision of a skin lesion. Thus, the excision of the pressure ulcer was viewed as more complex, and therefore, assigned to a different APG. Anatomical site (e.g., face, hand, etc.) within a body system was used in order to ensure medical similarity (e.g., procedures of the external ear versus the internal ear), and was also used to implicitly reflect complexity (e.g., treatment of a closed fracture of a finger is usually less complex than treatment of a closed fracture of other sites).

If a procedure involved the insertion of a device (e.g., neurostimulator), then a separate APG was formed in order to recognize the cost of the device. Medical specialty was never explicitly used in the significant procedure APG formation; but procedures normally done by different medical specialties were usually put in different APGs.

During the formation of DRGs, charge data was, in general, found to reflect the relative needs of patients. The number of bed days and ancillary services consumed by patients depended on their needs. However, ambulatory charge data is highly influenced by Relative Value Unit (RVU) scales. The RVU scales are published and generally provide a relative measure of resource use, physician time and cognitive effort. Thus, ambulatory charges for a procedure do not necessarily reflect the actual needs or complexity of an individual patient but are based on the established RVU for the procedure. Thus, statistical results from charge data often simply reflect the established RVU scales. Although charge data was used extensively in the APG development, it was necessary for the clinical team to make judgments on whether observed charge differences across different procedures reflect real differences in the resources required to perform the procedure or the bias of the established RVU scales.

For example, there are different CPT codes for excisions of benign and malignant skin lesions. RVU and charge data implied that excisions of malignant skin lesions of the same site and size used significantly more resources than benign skin lesions. However, the histology of the lesion is usually not known at the time of the procedure, but is established when a pathology report is returned. Further, the excision of a malignant and benign skin lesion of the same site and size are fundamentally the same procedure except that a wider margin is excised for lesions which are suspected to be malignant. Thus, the significant procedure APGs do not differentiate between malignant and benign skin excisions. In addition, procedure APGs avoid assigning procedures to different APGs based on subtle or easily gameable distinctions in the CPT codes. For example, deep and superficial muscle biopsies are in the same APG because the distinction between deep and superficial lacks a precise definition in the CPT coding system.

The process of forming the significant procedure APGs resulted in 145 significant procedure APGs. A list of the significant procedure APGs is contained in Appendix C.

Development of the Medical APGs

Medical APGs describe patients who receive medical treatment but do not have a significant procedure performed during the visit. The fact that a patient had a specific significant procedure performed provides a great deal of precise information regarding the amount and type of resources typically used during the visit. Patients without a significant procedure (i.e., medical patients) can use a wide range of resources depending on the condition of the patient at the time of the visit. Medical patients can be described using the diagnoses of the patient coded in the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM). ICD-9-CM allows both specific diseases (e.g., pneumonia) as well as signs, symptoms and findings (e.g., chest pain, melena, elevated sedimentation rate, etc.) to be coded. The term diagnosis will be used to refer generically to diseases, signs, symptoms and findings. The standard Medicare claims form and the ICD-9-CM ambulatory coding guidelines require that the diagnosis that was the primary reason for the visit be indicated. Further, any additional diagnoses that are present may be listed on the claim as secondary diagnoses. The primary variable used to form the medical APGs was the diagnosis coded as the reason for the visit.

There are several ICD-9-CM coding conventions that influenced the use of the ICD-9-CM diagnosis code in forming the medical APGs:

- Diagnoses are coded to the highest degree of certainty known at the time of the visit. Thus, if a disease is suspected but not established, then the disease is not coded. Instead, the most specific sign, symptom or finding (SSF) that is present is coded.
- SSFs that are an integral part of an established disease are not coded as secondary diagnoses (e.g., nausea with gastroenteritis).
- SSFs that are not routinely associated with an established disease may be coded as additional diagnoses (e.g., hemiparesis with a stroke).
- Acute diseases are coded until there is no evidence of disease (e.g., pneumonia is coded at every visit until there is no longer any evidence of the presence of pneumonia).
- Chronic diseases treated on an ongoing basis are coded as many times as the patient received treatment for the disease.

The rules for coding SSFs are especially important since the treatment of a medical patient is often highly influenced by the SSFs present at the time of the visit. In general, the coding of a disease simply indicates that the disease was present but gives no indication of how extensive or severe the disease was at the time of the visit. The coding of the nonroutine SSFs in addition to the underlying disease provides some indication of the extensiveness of the disease. The use of nonroutine SSFs in the definition of the medical APGs was very limited because of limitations in the ICD-9-CM codes for SSFs:

- Many of the ICD-9-CM codes for SSFs are not precise. For example, abdominal rigidity (7894) has no precise clinical significance. In contrast, abdominal rebound would have precise clinical significance but there is no code for abdominal rebound in ICD-9-CM.
- There are some SSF codes such as stupor and coma (7800) that mix precise clinical findings (i.e., coma) with an imprecise clinical finding (i.e., stupor).
- There are a large number of SSF codes that refer to abnormal laboratory results that are imprecise. For example, a diagnosis of hypokalemia does not convey useful information since the range of potassium levels associated with hypokalemia can vary significantly in terms of clinical significance.

In addition to the imprecision of many of the SSF codes, the use of SSFs as a primary variable in the medical APGs could create opportunities for upcoding. If the APGs defined based on SSFs had a high payment weight then there would be a financial motivation to code the SSFs instead of the underlying disease. The fact that only nonroutine SSFs are coded also limited the applicability of SSFs in the definition of the medical APGs. As a result of the above problems associated with SSFs, the SSFs used in the definition of the medical APGS were restricted to SSFs with the following characteristics:

- SSFs with a relatively precise clinical meaning
- SSFs that were significant enough not to be a routine part of most diseases
- SSFs that were significant enough to tend to dominate the resources used during the visit. Thus, upcoding would not be an issue since assignment to the SSF APG would be appropriate irrespective of the underlying disease.

Thus, a single major SSF APG for medical patients was formed. Examples of SSFs included in the major SSF APG are meningismus and gangrene. In addition to the SSF codes, there were also ICD-9-CM codes included in the major SSF APG that specify both the underlying disease and the SSF (e.g., diabetic ketoacidosis). A patient is assigned to the major SSF APG whether the major SSF is coded as the reason for the visit or as a secondary diagnosis. The major SSF APG identifies the medical patients with extensive diseases who require significant amounts of resources. Patients who have non-major SSFs coded as the reason for the visit, are assigned to the medical APG which is usually associated with the SSF (e.g., cough is assigned to the upper respiratory infection APG).

In addition to the presence of a major SSF, there are also two other indicators that can be used to identify patients with extensive diseases. Patients who die (e.g., trauma or AMI patients) during an outpatient visit or who are admitted to the hospital following an outpatient visit often use large amounts of resources. Deaths and hospital admissions are particularly relevant for patients treated in the emergency room. Patients who are admitted through the emergency room have the emergency room charges included in the inpatient bill. However, patients seen in one hospital's emergency room but admitted to another hospital will have an outpatient claim for the emergency room visit. Patients who die or are admitted are atypical and are assigned to a separate APG. The process of forming the medical APGs begins with the identification of patients who died or were admitted followed by the identification of patients who had a major SSF.

Given that patients who died, were admitted or who had a major SSF are assigned to separate APGs, the medical APGs were formed primarily on the basis of the ICD-9-CM diagnosis code that was the reason for the visit. Thus, all possible ICD-9-CM diagnoses were divided into a set of mutually exclusive and clinically similar classes. The classification variables considered in the formation of the medical classes are shown in Table 3.

Variable	Example
Etiology	Trauma, Malignancy, etc.
Body System	Respiratory, Digestive, etc.
Type of Disease	Acute or Chronic
Medical Specialty	Dental, Gynecology, etc.
Patient Age	Pediatric, Adult, etc.
Patient Type	New or Old
Complexity	Time Needed to Treat the Patient

Table 3 Medical APG Classification Variables

The initial variable used to form the medical APGs was the etiology of the diagnosis that was the reason for the visit. The etiology subgroups are shown in Table 4.

Etiology
Well Care and Administrative
Malignancy
Trauma
Poisoning
Mental diseases
Alcohol and Drug Abuse
Pregnancy
Neonate
Other Etiology

Table 4 Etiology

As a first step in the formulation of the medical APGs each ICD-9-CM diagnosis code was assigned to one of the etiology subgroups. Malignancies and trauma were assigned to separate subgroups since they had unique resources associated with the care provided (e.g., frequent radiology and laboratory services). The other etiology group encompasses a broad spectrum of diseases from acute infectious diseases to chronic diseases such as hypertension. The other etiology group was then divided into subgroups based on the body system of the diagnosis that was the reason for the visit. The body systems are shown in Table 5 and the initial subdivision of the medical APGs is shown in Figure 2. Once all the subclasses based on the etiology and the body system were formed, then the other classification variables in Table 3 were used to further subdivide each etiology and body system.

Whether a diagnosis was acute or chronic was not explicitly used in the formation of the medical APGs. There are medical APGs which contain only diagnoses that are acute or chronic, but a medical APG was never formed for the explicit purpose of identifying acute or chronic diseases. Medical specialty was never explicitly used in the medical APG formation, but diseases normally treated by different medical specialties were usually put in different APGs. If, for certain diseases, pediatric patients are usually treated differently (e.g., asthma), then patient age was used to form pediatric APGs.

Body Systems
Nervous Diseases
Eye Diseases
Ear, Nose, Throat and Mouth Diseases
Respiratory Diseases
Cardiovascular Diseases
Digestive Diseases
Musculoskeletal Diseases
Skin and Breast Diseases
Endocrine, Nutritional and Metabolic Diseases
Kidney and Urinary Tract Diseases
Male Reproductive Diseases
Female Reproductive Diseases
Immunologic and Hematologic Diseases
Infectious Diseases

Table 5 Body Systems Used to Subdivide the Other Etiology Group

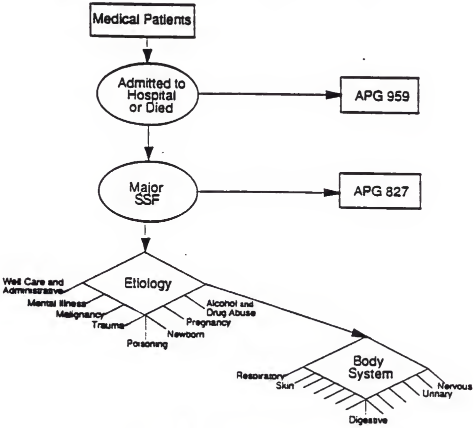

Figure 2 Initial Medical APG Logic

Whether a patient was a new patient or an old patient was considered as a possible variable in the formation of the medical APGs. However, the new patient old patient distinction was not used for the following reasons:

- There is difficulty in establishing a precise definition of a new patient. New can refer to either the physician or the facility. Thus, a patient may be considered new only the first time the patient is treated as an outpatient at the hospital. Alternatively, the patient may be considered new for each visit in which the patient is treated by a different physician. From a resource use perspective, the presence of new diagnoses or problems is just as important as whether the patient is new to the facility or physician. The only definition of new that would not be prone to upcoding would be new to the facility.
- The impact on resources of whether a patient was a new patient would be expected to vary by setting. For emergency room and same day surgery units, the fact that the patient was new would be expected to have little impact on resource use. For an outpatient clinic a new patient would be expected to tend to utilize more resources.
- The designation of whether a patient was a new or old patient is not present on the current Medicare UB-82 claim form. Thus, a change in reporting requirements would be necessary.

Patient complexity basically refers to the amount of time normally required to treat a patient. In a visit based payment system, visit time is an important determinant of facility fixed cost since it directly affects both the number of visits that can be provided and the amount of overhead costs that can be allocated to each visit. To illustrate this point, consider the example in which there are two hospital outpatient departments (OPDs), one which treats only patients of type A and one which treats only patients of type B. Type A patients have an average visit time of 30 minutes and type B patients have an average visit time of 15 minutes. Suppose further, that the basic facility costs (e.g., square footage, type of room, support staff, supplies, equipment and other overhead costs) necessary to treat type A and type B patients are identical. Thus, the only difference in the treatment of these two kinds of patients is the visit time. Suppose the annual facility cost is the same at each hospital and is $1,000,000 per year. Each OPD has two examining rooms and is run 10 hours a day, 6 days a week and sees patients at full capacity. Thus, the OPD treating type A patients is able to see 12,480 patients per year and the OPD treating type B patients is able to see 24,960 patients per year. Thus, the facility cost per visit for the OPD treating type A patients is $80.12 per visit, while the facility cost per visit for the OPD treating type B patients is $40.06 per visit. With the same annual cost, the type B patients have a shorter average visit time and therefore, more patients can be seen. In forming the medical APGs, visit time was considered an important factor in the determination of resource use and the associated facility cost. Thus, separate medical APGs were formed to recognize differences in visit time.

The final issue that was considered in the formation of the medical APGs was the amount and type of ancillary services that would typically be provided to a patient. Since the cost of some ancillary services will be included in the base visit payment, patients with different profiles of ancillary service use needed to be in different APGs. For example, suppose the cost of a simple blood test is $20.00 and that cost of a simple blood test would be included in the base visit payment. Further, assume that 90% of the patients of type A receive a blood test and only 10% of the patients of type B receive a blood test. For type A patients, $18.00 (i.e., 0.9 x $20) must be added to the visit cost in order to allow an OPD to recover the cost of providing the blood tests, while for type B patients only $2.00 (i.e., 0.1 x $20) must be added to the visit cost. Thus, if the cost of ancillary services are included in the base visit payment, then the amount and type of ancillaries used during a medical visit must be taken into consideration when forming the medical APGs.

The process of forming the medical APGs resulted in 80 medical APGs. A list of the medical APGs is contained in Appendix C.

Development of Ancillary Services APGs

Ancillary services refer to ancillary tests (i.e., laboratory, radiology and pathology) and ancillary procedures (e.g., immunization, anesthesia, insertion of an IUD, etc.). Ancillary APGs were formed for each type of ancillary service.

Laboratory APGs

The classification variables considered in the formation of the laboratory APGs are shown in Table 6.

Classification Variable	Example
Laboratory Department or Type	Chemistry, Hematology
Testing Method	Radioimmunoassay
Bodily Source of Specimen	Blood, Urine
Complexity	Time, Skill Level and Equipment Needed to Perform Test

Table 6 Laboratory Classification Variables

The laboratory department in which the laboratory test would typically be performed was used as the primary variable in the formation of the laboratory APGs. Thus, tests performed by the different laboratory departments (e.g., hematology, microbiology, toxicology, etc.) were assigned to different APGs. The testing method (e.g., radioimmunoassay) was used to a limited extent when the method represented a substantially different type of test with relatively clear indication for usage. However, in general, different methods of performing the same test were placed in the same APG. A laboratory technician will typically employ different methods depending on the precision of result which is needed. However, different methods are also employed depending on the training of the laboratory professional. For example, while there is a clear difference between a fluorimetric versus chromatographic method in the determination of the calcium level, there frequently are not precise indications on when to do one versus the other. As a consequence, the different methods for performing the same test were usually assigned to the same APG. The same type of laboratory test (e.g., chemistry) was sometimes differentiated by the source of specimen (e.g., blood versus urine) in order to account for the labor cost of collecting and transporting the specimen. Finally, the same type of laboratory test was usually differentiated based on the complexity of the test. Tests which required more time, technicians with greater skill levels or expensive equipment were assigned to different APGs. For example, multichannel chemistry tests were assigned to a separate APG from other chemistry tests due to the cost of the equipment used to perform a multichannel chemistry test. Laboratory tests which required no equipment and would typically be performed during a visit (e.g., blood or urine dipstick tests) were assigned to a single APG as a result of their very low level of complexity. During the development of the laboratory APGs, physicians who either headed or worked in hospital laboratory departments and technicians who perform the test were consulted. In addition, the laboratory relative value units developed by the American College of Pathology were utilized. There are a total of 23 laboratory APGs.

Radiology APGs

The classification variables considered in the formation of the radiology APGs are shown in Table 7.

Classification Variable	Example
Type of Equipment	MRI, CAT
Contrast Media	Used or Not Used
Anatomic Site	Digestive, Circulatory
Purpose	Diagnostic, Therapeutic

Table 7 Radiology Classification Variables

The type of equipment (MRI, CAT, plain film, etc.) was the primary classification variable for the radiology APGs since the cost of the radiology equipment varies considerably across the different types of radiological procedures. Diagnostic x-rays were distinguished based on whether a radio-opaque contrast media was used since there are additional costs associated with the supply cost of the contrast media and the injection of the contrast media. Diagnostic x-rays requiring a radiopaque contrast media were divided based on the anatomic site studied since the anatomic site, in general, reflected the complexity of the procedure. Nuclear medicine was separated into diagnostic and therapeutic groups. There are a total of 20 radiology APGs.

Pathology APGs

Pathology is divided into two APGs based on the complexity of the pathology test. Pathology tests requiring more time or greater skill levels were assigned to the complex pathology APG.

Anesthesia APG

All of anesthesiology is assigned to a single APG. The CPT codes do not differentiate between general and local anesthesia and it was therefore not possible to create separate general and local anesthesia APGs. However, the procedures in each significant procedure APG typically have the same type of anesthesia administered. Thus, if the APG payment system included the cost of anesthesia in the payment for a significant procedure the absence of a differentiation on the type of anesthesia will not present a problem.

Ancillary Tests and Procedures

Other ancillary tests include ECG, other electrocardiographic tests and vestibular function tests. Ancillary procedures are procedures that do not dominate the time and resources expended during a visit, but do increase the time and resources expended during a visit. Thus, ancillary procedures can be performed as part of a medical visit and do increase the cost of the medical visit. Ancillary procedures include immunizations, introduction of needles and catheters, simple anoscopy, biofeedback and hypnotherapy, infusion therapy, minor urinary tube changes, minor gynecological procedures and minor ophthalmological procedures. Immunizations are divided into three APGs based primarily on the cost of the vaccine (e.g., rabies vaccination is considered a complex immunization). There are a total of 15 ancillary test and procedure APGs.

Chemotherapy APGs

There are two significant procedure APGs for chemotherapy that are based on the route of administration of the chemotherapy (i.e., IV push versus continuous infusion, APG 132 and 131, respectively). These two significant procedure APGs reflect the difference in supplies and the labor cost of monitoring the administration of the chemotherapy drug. There is a second major cost component associated with chemotherapy and that is the cost of the chemotherapy drug.

Chemotherapy drug costs can vary considerably and, therefore, three additional chemotherapy APGs were formed to reflect the costs of chemotherapy drugs. Individual chemotherapy drugs are assigned specific HCPCS codes. Thus, the payment for a chemotherapy visit is composed of two APGs, one for the route of administration and one for the chemotherapy drug.

Error APG

There are five situations in which an APG number is assigned to indicate an error or inconsistency was present. In these cases the APG does not result in a payment but simply classifies the type of error. When an error is detected APG 999 is assigned. Any CPT code that represents an inpatient procedure (e.g., CPT code 61304 for craniotomy) is considered an error. CPT codes that represent profiles of laboratory tests such as general health screen profile (CPT code 80050) and executive profile (CPT code 80053) are considered an error since there is no agreement in the literature regarding the appropriate composition of these profiles. There are some ICD-9-CM codes that indicate that a procedure was performed (e.g., ICD-9-CM code V252 sterilization). If no procedure is recorded on the claim and the patient has as the reason for the visit an ICD-9-CM code indicating a procedure, then the claim is considered an error. There are some ICD-9-CM codes that describe situations that could not be a reason for an outpatient visit (e.g., ICD-9-CM code 7989 unattended death). If a patient has one of these ICD-9-CM codes as the reason for the visit, the claim is considered an error. If there are no valid CPT or ICD-9-CM codes on the claim, then no APGs can be assigned and the claim is considered an error.

The process of forming the APGs required a balance between the number of APGs, clinical consistency and homogeneity in charge and visit time. Clinical consistency was required in order for any procedures or diagnoses to be grouped into an APG. However, in general, an APG would not be formed solely on clinical grounds. Verification of consistent differences in charges or visit time was required in order to form an APG. In general, infrequent APGs were not formed unless there was strong clinical justification and a large charge difference. For example, pacemaker replacements are infrequent on an outpatient basis, but pacemaker replacements do represent a very clinically distinct group of patients with a very high cost. Thus, a pacemaker replacement APG was formed. The end result of the process of forming the APGs is a clinically consistent group of patient classes that are homogeneous in terms or resource use.

Formation of the APG for Diagnostic Upper GI Endoscopies

The APG for diagnostic upper GI endoscopies will be used as an example of the process used to form the APGs. While the individual CPT codes that comprise the APGs for diagnostic and therapeutic upper GI endoscopies (e.g., APGs 162 and 163, respectively) appear reasonable from both a clinical and resource use perspective, a significant amount of data analysis and review with clinical experts was necessary before the final APG structure was created. Initially, several different approaches to the classification of upper GI endoscopies were considered. For example, in an effort to minimize the number of APGs, all diagnostic GI endoscopies were placed in one APG and all therapeutic GI endoscopies were placed in a second APG, irrespective of portal of entry. However, the historical charges within both the diagnostic GI endoscopy class and the therapeutic GI endoscopy class showed consistent differences based on the portal of entry (e.g., anus versus mouth). Across the individual databases, the upper GI endoscopies consistently had at least 20 percent higher charges. Consultation with gastroenterologists confirmed that upper GI endoscopies would in general require more time and resources. Once it was decided to create the GI endoscopy APGs based on portal of entry, it was important to examine the necessity of creating additional APGs based on whether the endoscopy was diagnostic or therapeutic. The data consistently indicated that therapeutic upper GI endoscopies had historical charges that were at least 30 percent higher than the diagnostic upper GI endoscopies. Again, consultation with gastroenterologists confirmed that therapeutic upper GI endoscopies would be expected to require more time and resources (e.g., pathology) than diagnostic upper GI endoscopies. Once the diagnostic upper GI endoscopy group was created, a great deal of discussion ensued as to which procedures should be assigned to this APG. It should be noted for example, that diagnostic upper endoscopy is divided into two CPT codes (i.e., simple and complex). These codes were placed together in the same APG, since there is no clear definition of what constitutes a simple as compared to a complex diagnostic upper GI endoscopy. Initially, the following CPT codes were also assigned to the diagnostic upper GI endoscopy APG:

91000	Esophageal Intubation
1055	Gastric Intubation
43600	Biopsy of Stomach by Capsule

These three procedures had very low historical charges. Based on the historical charge data and clinical review, these codes were removed from the diagnostic upper GI endoscopy APG and assigned to an APG for percutaneous and other simple gastrointestinal biopsies (i.e., APG 159). Endoscopic catheterization of the pancreas (ERCP) was not assigned to the diagnostic upper GI endoscopy APG even though the portal of entry is the mouth. ERCP is a significantly more difficult procedure than an endoscopy of the esophagus or stomach, and therefore ERCPs, were assigned to the APG for other gastrointestinal, endoscopy procedure (i.e., APG 166). There are six CPT codes that constituted the final diagnostic upper GI endoscopy APG (i.e., APG 162). The endoscopies included in APG 162 are endoscopies of the esophagus, stomach, duodenum and jejunum. The evaluation of alternative classification variables for defining the diagnostic upper GI endoscopy APG and the repetitive evaluation of historical data and clinical review is typical of the process that was used in forming the APG definitions.

Summary of APG Development

The process of forming the APGs resulted in a total of 297APGs. The APGs are composed of the different types shown in Table 8.

Type of APG	Count
Significant Procedure	145
Medical	80
Laboratory	23
Radiology	20
Pathology	2
Anesthesia	1
Ancillary Tests and Procedures	15
Incidental Procedures	8
Chemotherapy Drugs	3
Total	297

Table 8 Types of APGs

A complete list of APGs is contained in Appendix C. Version 1.0 of the APGs utilized the calendar year 1989 version of CPT and Fiscal Year 1990 version of the ICD-9-CM diagnosis codes. Appendix B contains a list of CPT procedure codes and the APG to which they are assigned. Appendix A contains a list of ICD-9-CM diagnosis codes and the APGs to which they are assigned.

The APGs as currently constructed describe the complete range of services provided in the outpatient setting. The APGs can form the basic building blocks for the development of a visit based outpatient prospective system and can provide a flexible structure for configuring the payment system to meet specific policy objectives.

Overview of the APG Payment System

In the APG system a patient is described by a list of APGs that correspond to each service provided to the patient. The assignment of multiple APGs to a patient is in contrast to the DRGs which always assign a patient to a single DRG. If a patient has multiple procedures then the DRGs use a procedure hierarchy to select the most appropriate DRG. The DRG payment includes the cost of all ancillary services provided to the patient. In the outpatient setting, the diversity of sites of service (i.e., same day surgery units, ERs and outpatient clinics), the wide variation in the reasons patients require outpatient care (e.g., well care to critical trauma care) and the high percentage of cost associated with ancillary services (i.e., the cost of ancillary services can often exceed the cost of the base visit) necessitates a patient classification scheme that can precisely reflect the services rendered to the patient. The APGs address the diversity within the outpatient setting by assigning patients to multiple APGs. For example, if a patient had two procedures performed plus a chest x-ray and a blood test, then there would be four APGs assigned to the patient (i.e., one APG for each procedure plus the APGs for the chest x-ray and the blood test). In a prospective payment system, each APG would have a standard payment rate, and the payment for a patient would be computed by summing the payment rates across all the APGs assigned to the patient. However, in order to provide incentives for cost control and to minimize opportunities for upcoding of APGs, not all the APGs assigned to a patient are used in the computation of the payment. The APG system uses three techniques for grouping different services provided during the same visit into a single payment unit.

Significant Procedure Consolidation

When a patient has multiple significant procedures, some of the significant procedures may require minimal additional time or resources. Significant procedure consolidation refers to the collapsing of multiple related significant procedure APGs into a single APG for the purpose of the determination of payment. For example, if both a simple incision and a complex skin incision are coded on a patient bill, only the complex skin incision will be used in the APG payment computation.

Ancillary Packaging

A patient with a significant procedure or a medical visit may have ancillary services performed as part of the visit. Ancillary packaging refers to the inclusion of certain ancillary services into the APG payment rate for a significant procedure or medical visit. For example, a chest x-ray would be packaged into the payment for a pneumonia visit.

> *Multiple Significant Procedure and Ancillary Discounting*
>
> When multiple unrelated significant procedures are performed or when the same ancillary service is performed multiple times, a discounting of the APG payment rates is applied. Discounting refers to a reduction in the standard payment rate for an APG. Discounting recognizes that the marginal cost of providing a second procedure to a patient during a single visit is less than the cost of providing the procedure by itself.

In general, a per visit prospective payment system has three components: the patient classification scheme (i.e., APGs), a significant procedure consolidation and ancillary packaging process and a payment computation. The three components of an APG payment system are shown in Figure 3.

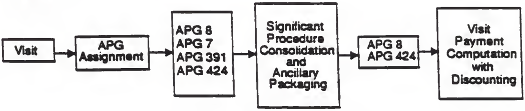
Visit
APG Assignment
APG 8
APG 7
APG 391
APG 424
Significant Procedure Consolidation and Ancillary Packaging
APG 8
APG 424
Visit Payment Computation with Discounting

Figure 3 APG Payment System

As part of the APG payment model, procedure consolidation and ancillary packaging routines were developed.

Significant Procedure Consolidation

There are 145 mutually exclusive significant procedure APGs. Each CPT procedure code is assigned to a single procedure APG. When a patient has multiple significant procedures, then the patient is assigned multiple significant procedure APGs. If the procedures are all in the same APG, then the significant procedure consolidation process will, for the purpose of payment, eliminate all the significant procedure APGs except one. The procedures that make up a significant procedure APG are very similar in terms of the purpose of the procedure and the amount of effort involved. Further, it is not typical to perform more than one procedure within an APG during one visit. As a consequence, the significant procedure consolidation will recognize only one procedure within a significant procedure APG.

If there are significant procedures in different APGs, then a significant procedure consolidation list is used to determine if multiple APGs will be used in computing payment. For example, if there are two procedures performed, and one procedure is assigned to the APG for simple skin excisions and the second procedure is assigned to the APG for complex skin excision, then as a result of the significant procedure consolidation only the complex skin excision APG will be used in the payment computation. The significant procedure consolidation list identifies, for each significant procedure APG, the other significant procedure APGs that are an integral part of the procedure and can be performed with relatively little additional effort. Thus, the consolidated procedures do not significantly increase resource use. For example, the therapeutic lower GI endoscopy APG consolidates the diagnostic lower GI endoscopy, the proctosigmoidoscopy and the anoscopy APGs. Conversely, unrelated significant procedures are not consolidated by the significant procedure list. For example, the treatment of a closed fracture and the suturing of a skin laceration would result in two significant procedure APGs being used in computing payment. Multiple unrelated significant procedures performed during the same visits are not consolidated in order to provide a fair level of payment and to avoid creating the incentives to have separate visits for each procedure.

The significant procedure consolidation list is contained in Appendix D. To illustrate the significant procedure consolidation process, consider the example shown in Table 9.

CPT Code	APG Assigned		Action
11406	8	Complex Skin Excision	Include in Payment Computation
11404	8	Complex Skin Excision	Within APG Consolidation for APG 8
11400	7	Simple Skin Excision	Consolidate with APG 8
45385	165	Therapeutic Lower GI Endoscopy	Include in Payment Computation
45378	164	Diagnostic Lower GI Endoscopy	Consolidate with APG 165
45330	160	Diagnostic Proctosigmoidoscopy	Consolidate with APG 165

Table 9 Example of significant procedure consolidation

In this example, the patient has been assigned six different CPT codes resulting in six significant procedure APGs being assigned. Two of the procedures are in the complex skin excision APG and are therefore consolidated into a single APG. The simple skin excision APG is consolidated into the complex skin excision APG and the diagnostic lower GI endoscopy and proctosigmoidoscopy APGs are consolidated into the therapeutic lower GI endoscopy. Thus, after consolidation, only two significant procedure APGs remain (i.e., the complex skin excision and the therapeutic lower GI endoscopy). The APG payment for the patient will be computed based on the two significant procedure APGs.

The significant procedure consolidation also greatly reduces the opportunities for the fragmentation of procedures for the purpose of increasing payment. For example, all minor skin procedures are consolidated into the significant procedure APGs which involve penetration of the skin (e.g., hernia repair). Since all similar procedures (within significant procedure consolidation) and all significant procedures that can be performed as part of another significant procedure (across significant procedure consolidation) are consolidated into a single APG for payment purposes, the fragmentation opportunities are minimized.

Ancillary Packaging

In the context of a per visit payment system, packaging refers to the inclusion of certain ancillary services into the payment for the visit. The significant procedure or medical visit combined with the packaged ancillary services would be considered as a single unit for purposes of payment. In the case of ambulatory surgery, for example, a packaged visit would combine the significant procedure with the related ancillary services into a single payment amount. Packaging is done to give providers the incentive to use the packaged ancillary services efficiently.

Under Medicare's DRG-based prospective payment system for hospital inpatient care, all ancillary services provided to a patient are packaged into the payment for the DRG to which the patient is assigned. Due to the nature of outpatient care, it is not clear that all services provided or ordered during a visit can be packaged into one payment rate. Medicare's current payment system for ambulatory care involves separate payments for ancillary services provided in conjunction with a visit. Payments for laboratory services are based on a fee schedule, while radiology services are reimbursed based on a blend of a hospital's reasonable costs and a radiology fee schedule. This payment method is designed to contain the cost per unit of service;

however, it provides no incentive for providers to control the volume of services. Packaging ancillary services into the payment rate for a visit provides that incentive by including the cost of the packaged ancillaries in the payment for the visit.

Ancillary packaging will allow the Medicare program to make a single payment for a well defined package of ambulatory services, thereby creating a consistent definition of services across providers. Further, packaging facilitates comparisons across providers and may encourage continuity of care by making providers financially responsible for ancillary services. Consequently, the providers may be more likely to incorporate the findings of tests into patient treatment plans. Finally, packaging will give providers the incentive to improve their efficiency by avoiding unnecessary ancillaries and by substituting less expensive but equally effective ancillary services for more costly options.

There are also some potential difficulties in the packaging of ancillaries. Packaging places providers at financial risk. If expensive ancillaries that are not usually performed for a particular type of visit are included in the packaged payment then the financial risk may be excessive. Since initially only hospital outpatient departments will be paid on a prospective basis ancillary packaging may encourage hospitals to set up freestanding clinic centers so that they would not be covered under the PPS. This is more likely to occur if the payment rates attached to the APGs do not adequately account for the cost of the packaged services. In addition, although the Medicare's payment per visit will be controlled by the packaging, there is no control over the number of visits. Thus, there may be an incentive to increase the number of visits and spread the costs of packaged ancillary services across the visits. However, this incentive is not different than incentives under the current unpackaged payment system. In addition, though a similar incentive was provided by the DRG system, hospital admissions fell after the DRGs were enacted.

Despite any potential difficulties with the packaging of ancillaries, it is clear that in a visit based payment system, some degree of ancillary packaging must occur in order to introduce the incentive to use ancillary services efficiently. If there were no packaging of ancillary services then the system would be similar to Medicare's current payment method for outpatient care in that it involves additional payments for each ancillary service. This approach is risk free for providers and it encourages ancillary utilization and discourages comparisons of cost across providers.

There are basically two alternative approaches to packaging: partial packaging or all inclusive packaging. Under partial packaging, ancillary services that are inexpensive or frequently provided, are packaged into the payment for the significant procedure or medical visit. However, other ancillary services, particularly those that are expensive or infrequently performed, are paid as separate ancillary APGs. Partial packaging limits the providers' risk. Under an all inclusive packaging, all services (including expensive ancillaries) that are provided during a visit are packaged into the visit payment. Thus, under an all inclusive approach if there were a $500 test that occurs on average once in one hundred visits, then the packaged payment for each visit would include $5 for this test. The partial packaging option was selected as the most appropriate option since it is feasible and would not impose a high level of risk for hospitals.

Given that partial packaging would be utilized in the APG payment system, it was then necessary to select the ancillary services that would be packaged into a procedure or medical visit. There are two alternative approaches to selecting the ancillaries to be packaged: clinical or uniform.

A clinical packaging approach would select the ancillaries to be packaged on an APG specific basis. The ancillaries to be packaged would be selected primarily on clinical grounds. Thus, only ancillaries that would clinically be expected to be a routine part of the specific procedure or medical visit would be packaged. The clinical approach has the benefit that the resulting package visit would be clinically meaningful. Further, since only routine ancillaries would be packaged into each APG the distribution of ancillary costs within the APG should be relatively homogeneous.

The alternative to clinical packaging would be to develop a uniform list of ancillaries that would always be packaged into every procedure or medical visit. There are several advantages associated with a uniform packaging of ancillaries. A uniform packaging is administratively simple. Once the uniform list of ancillaries was developed, both the Medicare fiscal intermediaries and hospitals would know with certainty that every ancillary of a particular type was always packaged. Thus, the tracking of the exact ancillaries that were packaged would be straightforward. Further, a uniform list of packaged ancillaries would be simple for hospitals to explain to their medical staff and thus, the incentive to efficiently utilize the packaged ancillaries could be effectively communicated. A uniform list of ancillaries would be less prone to manipulation by hospitals. With a clinical packaging of ancillaries, procedure or medical visits would have different levels of ancillaries packaged across the different APGs. Thus, there would be an incentive to code the patient into the procedure or medical APG with the fewest packaged ancillaries. This would present a particular problem for medical visits in which multiple diagnoses were present. For medical visits with multiple diagnoses, the ancillary tests may be performed for the secondary diagnoses. The uniform packaging of ancillaries also removes the incentive to perform nonroutine tests. Under a clinical packaging, low cost nonroutine tests would not be packaged into the visit payment. This would provide a financial incentive for providers to perform such nonroutine tests. A uniform packaging would include in the packaging for each APG a wider array of ancillaries and thus, there would be less opportunity for additional payments from nonroutine ancillaries.

A uniform packaging of ancillaries was selected for use in the APG payment model. An attempt to develop a clinical packaging of ancillaries proved difficult. There were relatively few ancillaries that are truly routine for particular APGs. Thus, the scope of the clinical packaging would have been fairly limited. The administrative simplicity, the relative freedom from manipulation and the wider scope of a uniform packaging of ancillaries led to its adoption.

The ancillary APGs included in the uniform packaging are contained in Table 10. The APGs included in the uniform packaging were primarily simple laboratory tests (e.g., basic chemistry), simple pathology, anesthesia, simple radiology (e.g., plain films), other minor tests (e.g., EKGs) and minor procedures and therapies (e.g., spirometry). In general, the ancillaries in the uniform packaging included ancillaries that are performed for a wide range of different types of visits and were relatively low cost compared to the average cost of the procedure and medical APGs. A few ancillaries were also included that were a routine part of one particular type of visit (e.g., obstetrical ultrasound). Only relatively low cost ancillaries were included in the uniform packaging since if high cost ancillaries were packaged into the visit payment, the patients who required such ancillaries would cause a substantial financial loss for the hospital. Hospitals would have a financial incentive to avoid treating those patients, causing a potential access problem for Medicare beneficiaries. In addition to the ancillary APGs, the cost of any incidental procedure APGs are always included in the payment for a significant procedure or medical visit. The cost of medical surgical supplies, drugs and all other facility related costs are included in the payment for a significant procedure or medical visit. The only exception is the cost of chemotherapy medication.

To illustrate the ancillary packaging, consider the example shown in Table 11, which is an expansion of the example in Table 9. In this example, the patient received four ancillary services. All the ancillary services are bundled except the complex endocrinology. The payment for the patient will be based on the complex skin excision, the therapeutic lower GI endoscopy and the complex endocrinology.

345	Obstetrical Ultrasound
351	Plain Film
365	Anesthesia
391	Simple Pathology
419	Simple Immunology Tests
421	Simple Microbiology Tests
423	Simple Endocrinology Tests
425	Basic Chemistry Tests
426	Simple Chemistry Tests
428	Multichannel Chemistry Tests
429	Simple Toxicology Tests
431	Urinalysis
434	Simple Clotting Tests
436	Simple Hematology Tests
439	Lithium Level Monitoring
440	Blood and Urine Dipstick Tests
443	Spirometry and Respiratory Therapy
447	Cardiogram
449	Simple Immunization
450	Moderate Immunization
452	Minor Gynecological Procedures
454	Minor Doppler, and ECG Monitoring
455	Minor Opthalmological Injections, Scrapings and Tests
456	Vestibular Function Tests
457	Minor Urinary Tube Change
458	Simple Anoscopy
459	Biofeedback and Hypnotherapy
460	Provision of Vision Aids
461	Introduction of Needles and Catheter

Table 10 Ancillary APGs included in uniform packaging

Discounting

In addition to significant procedure consolidation and ancillary packaging the visit payment computation could also include discounting. Discounting refers to a reduction in the standard payment rate for an APG. The need for discounting occurs when multiple procedures or ancillaries are performed. For example, discounting could compensate for the reduced cost per procedure of doing multiple significant procedures at the same time. When multiple significant procedures are performed, in general, the patient preparation, use of the operating room and

CPT Code	APG Assigned		Action
11406	8	Complex Skin Excision	Include in Payment Computation
11404	8	Complex Skin Excision	Within APG Consolidation for APG 8
11400	7	Simple Skin Excision	Consolidate with APG 8
45385	165	Therapeutic Lower GI Endoscopy	Include in Payment Computation
45378	164	Diagnostic Lower GI Endoscopy	Consolidate with APG 165
45330	160	Diagnostic Proctosigmoidoscopy	Consolidate with APG 165
88304	391	Simple Pathology	Package
82947	425	Chemistry Tests	Package
84236	424	Complex Endocrinology Tests	Include in Payment Computation
93000	477	Cardiogram	Package

Table 11 Example of Significant Procedure Consolidation and Ancillary Packaging

recovery time is shared between the two procedures. Thus, the cost of doing two procedures at the same time is less than the cost of doing the two procedures at two different times. Discounting can also be used to provide a financial incentive not to repeat the same ancillary service multiple times. Since the performance of multiple ancillaries in the same APG may be clinically necessary and appropriate, there is no consolidation of ancillaries within the same APG. Thus, each nonpackaged ancillary in the same APG will result in an additional payment. However, in order to provide some financial incentive not to repeat ancillary tests, multiple ancillaries in the same APG could be discounted. The level of any discounting is a policy decision and would be determined during system implementation.

Conclusions

A visit based APG prospective payment system with significant procedure consolidation, uniform ancillary packaging and multiple APG discounting can provide an effective system for the payment of the facility component of hospital based outpatient care. The structure of the APG payment model provides considerable flexibility. The level of significant procedure consolidation, ancillary packaging and discounting can be altered in order to change the incentives in the system and achieve specific policy objectives.

The APGs form a manageable, clinically meaningful set of patient classes that relate the attributes of patients to the resource demands and associated costs experienced by a hospital outpatient department. Like the DRGs, the APGs will evolve over time. As coding rules change, as more accurate and comprehensive data is collected, or as medical technology or practice changes, the APG definitions can be modified to reflect these changes. Together the APG patient classification and the APG payment model constitute a flexible framework for establishing an outpatient prospective payment system.

Each of the APGs is defined by a particular set of patient attributes which include the diagnosis that was the reason for the encounter, specific secondary diagnoses, procedures, age, sex and disposition status. The purpose of the APG Definitions Manual is to specify the patient attributes that define each APG. In order to provide a specification of each APG, a tree diagram depicting the APG structure is provided, as well as a detailed description of patient attributes which define each APG.The tree diagrams describing the APG structure utilize several symbols to describe the different types of decisions made when determining APG assignment. Within each tree diagram symbol, text will appear indicating the precise decision being made.

◆ A diamond indicates that a decision is being made on a single variable as opposed to a search of several variables. This symbol is used when the decision variable in the APG structure is reason for the encounter.

● A circle indicates a decision is being made by searching the reason for the encounter as well as all listed secondary diagnoses to determine if a major sign, symptom or finding is present.

■ A square indicates that APG assignment has been completed.

⬟ A pointer indicates that the tree diagram structure is continued on another page.

The description of the patient attributes which define each APG begins with a one line description of the APG. This description includes the APG number and a brief description of the APG. Following the APG description is a series of headings which indicate the patient characteristics used to define the APG. These headings indicate how the patient's diagnoses and procedures are used in determining APG assignment. Following each heading is a complete list of all the ICD-9-CM diagnosis or CPT procedure codes which are included in the APG. The following headings appear in the DRG definitions:

Reason For Encounter Diagnosis

Indicates that a specific set of diagnoses are used in the definition of the APG.

CPT Procedures

Indicates that a specific set of procedures are used in the definition of the APG.

APPENDIX C

List of APGs

Significant Procedure APGs

Skin, Subcutaneous Tissue and Muscle

1	Photochemotherapy
2	Superficial needle biopsy or aspirations
3	Simple incision and drainage
4	Complex incision and drainage
5	Debridement of nails
6	Simple debridements and destructions
7	Simple excisions and biopsies
8	Complex excisions, biopsies and debridements
9	Lipectomy and excisions with reconstructions
10	Simple skin repairs
11	Complex skin repairs
12	Skin and integument grafts, transfers and rearrangements

Breast

27	Simple incisions and excisions of breast
28	Breast reconstructions and mastectomies

Bones, Joints and Tendons

53	Occupational therapy
54	Physical therapy
55	Diagnostic arthroscopies
56	Therapeutic arthroscopies
57	Replacement of casts
58	Splints, strapping and cast removals
59	Simple closed fractures and dislocations of fingers, toes and ribs
60	Closed fractures and dislocations except fingers, toes and ribs
62	Open fractures and dislocations except face
63	Joint manipulation under anesthesia
64	Simple maxillofacial procedures
65	Complex maxillofacial procedures

66	Incisions of bones joints and tendons
67	Bunion procedures
68	Excisions of bones joints and tendons of the hand and foot
69	Excisions except arthrotomies of bones, joints and tendons except hand and foot
70	Arthroplasty
71	Hand and foot tenotomy
72	Simple hand and foot repairs except tenotomy
73	Complex hand and foot repairs
74	Repairs of bones joints and tendons except hand and foot
75	Arthrotomy except hand and foot
76	Arthrocentesis and ligament or tendon injection
77	Speech Therapy

Respiratory, Nose, throat and Mouth

79	Pulmonary tests and therapies except spirometry
80	Needle or catheter biopsies, aspirations, lavage and intubation
81	Simple endoscopy of the upper airway
82	Complex endoscopy of the upper airway
83	Simple endoscopy of the lower airway
84	Complex endoscopy of the lower airway
85	Nasal cauterizations and packings
86	Simple lip, mouth and salivary gland procedures
87	Complex lip, mouth and salivary gland procedures
88	Miscellaneous sinus, tracheal and lung procedures

Cardiovascular

105	Exercise tolerance tests
106	Echocardiography
107	Phonocardiograms
108	Cardiac Electrophysiologic tests
109	Vascular cannulation with needle or catheter
110	Diagnostic cardiac catheterization

111	Angioplasty and transcatheter procedures
112	Pacemaker insertion and replacement
113	Removal and revisions of pacemaker and vascular devices
114	Minor vascular repair and fistula construction
115	Secondary varicose veins and vascular injection
116	Vascular ligation
117	CPR and intubation

Hematologic, Lymphatic and Endocrine

131	Chemotherapy by infusion
132	Chemotherapy except by infusion
133	Transfusions and phlebotomies
134	Blood and blood product exchanges
135	Deep lymph structure and thyroid procedures
136	Allergy tests and immunotherapy

Digestive

157	Alimentary tests and simple tube placements
158	Esophageal dilation without endoscopy
159	Percutaneous and other simple gastrointestinal biopsies
160	Diagnostic proctosigmoidoscopy and anoscopy with biopsy
161	Proctosigmoidoscopy with excision or biopsy
162	Diagnostic upper GI endoscopy
163	Therapeutic upper GI endoscopy
164	Diagnostic lower GI endoscopy
165	Therapeutic lower GI endoscopy
166	Other gastro intestinal endoscopy procedures
167	Tonsil and adenoid procedures
168	Hernia and hydrocele procedures
169	Simple hemorrhoid procedures
170	Simple anal and rectal procedures except hemorrhoidectomy
171	Complex anal and rectal procedures
172	Peritoneal procedures and changes of intra-abdominal tubes

173	Miscellaneous digestive procedures

Urinary

183	Simple urinary studies and procedures
184	Renal ESWL
185	Urinary catheterization and dilatation
186	Hemodialysis
187	Peritoneal dialysis
188	Simple cystourethroscopy
189	Complex cystourethroscopy and litholapaxy
190	Percutaneous renal endoscopy, catheterization, or ureteral endoscopy
191	Cystotomy
192	Simple urethral procedures
193	Complex urethral procedures

Male Reproductive

209	Testicular and epididymal procedures
210	Penile prosthesis
211	Complex penile procedures
212	Simple penile procedures
213	Prostate needle or punch biopsy
214	TURP and other prostate procedures

Female Reproductive

235	Artificial fertilization
236	Procedures for pregnancy and neonatal care
237	Treatment of spontaneous abortion
238	Therapeutic abortion
239	Vaginal delivery
240	Female genital endoscopy
241	Colposcopy
242	Miscellaneous female reproductive procedures

243	D & C
244	Female genital excision and repair

Nervous

261	EEG
262	Electroconvulsive therapy
263	Nerve and muscle tests
264	Injection substance spinal cord
265	Subdural and subarachnoid tap
266	Nerve injection and stimulation
267	Revision or removal of neurological devices
268	Neurostimulator and ventricular shunt implantation
269	Carpal tunnel release
270	Nerve repairs and destructions
271	Complex nerve repairs
272	Spinal tap

Eye

287	Ophthalmological tests and minor procedures
288	Contact lenses
289	Simple laser eye procedures
290	Complex laser eye procedures
291	Cataract procedures
292	Simple anterior segment eye procedures for glaucoma
293	Complex anterior segment eye procedures for glaucoma
294	Simple anterior segment eye procedures
295	Moderate anterior segment eye procedures
296	Complex anterior segment eye procedures
297	Simple posterior segment eye procedures
298	Complex posterior segment eye procedures
299	Strabismus and muscle eye procedures
300	Simple repairs and plastic eye procedures
301	Complex repairs and plastic eye procedures

Ear

313	Otorhinolryngologic function tests
314	Major external ear procedures
315	Tympanostomy and other simple middle ear procedures
316	Tympanoplasty and other complex middle ear procedures
317	Inner ear procedures
318	Simple audiometry
319	Remove impacted cerumen

Ancillary Test and Procedure APGs

Radiology

341	Simple diagnostic nuclear medicine
342	Complex diagnostic nuclear medicine
343	Therapeutic nuclear medicine by injection
344	Radiation therapy
345	Obstetrical ultrasound
346	Other ultrasound
347	Hyperthermia
348	Magnetic Resonance Imaging
349	Computerized Axial Tomography
350	Mammography
351	Plain film
352	Fluoroscopy
353	Cerebral, pulmonary, cervical and spinal angiography
354	Venography of extremities
355	Non-cardiac, non-cerebral vascular radiology
356	Digestive radiology
357	Urography and genital radiology
358	Arthrography
359	Myelography
360	Miscellaneous radiology

Anesthesia

365	Anesthesia

Pathology

391	Simple surgical pathology
392	Complex surgical pathology

Laboratory

417	Tissue typing
418	Human tissue culture
419	Simple immunology test
420	Complex immunology test
421	Simple microbiology
422	Complex microbiology
423	Simple endocrinology
424	Complex Endocrinology
425	Basic chemistry
426	Simple chemistry
427	Complex chemistry
428	Multichannel chemistry
429	Simple toxicology
430	Complex toxicology
431	Urinalysis
432	Therapeutic drug monitoring
433	Radioimmunoassay tests
434	Simple clotting test
435	Complex clotting test
436	Simple hematology tests
437	Complex hematology tests
439	Lithium level monitoring
440	Blood and urine dipstick tests

Ancillary Tests and Procedures

443	Spirometry and respiratory therapy
444	Infusion therapy except chemotherapy
447	Cardiogram
449	Simple immunization
450	Moderate immunization
451	Complex immunization

452	Minor gynecological procedures
454	Minor doppler, electrocardiographic and ambulatory blood pressure monitoring tests
455	Minor opthalmological injections, scrapings and tests
456	Vestibular function tests
457	Minor urinary tube changes
458	Simple anoscopy
459	Biofeedback and hypnotherapy
460	Provision of vision aids
461	Introduction of needles and catheters

Chemotherapy Drugs

500	Class one chemotherapy drugs
501	Class two chemotherapy drugs
502	Class three chemotherapy drugs

Incidental Procedures

469	Professional services
*470	Individual psychotherapy
*471	Group psychotherapy
*472	Psychotropic medication management
*473	Comprehensive psychiatric evaluation and treatment
*474	Family psychotherapy
475	Radiological supervision and interpretation only
478	Therapeutic radiology planning and device construction

* Used to assign patients to the medical APGs for mental diseases and Alcohol and Drug abuse (i.e., APGs 654-659, 664-670).

Medical APGs

Malignancy

601	Hematological Malignancies
602	Prostatic Malignancy
603	Lung Malignancy
604	Skin Malignancy
605	Other Malignancies

Poisoning

616	Poisoning

Trauma

631	Head and Spine Injuries
632	Burns and Skin, Soft Tissue Injuries
633	Fractures, Dislocations and Sprains
634	Other Injuries

Mental Diseases

654	Individual Supportive Treatment for Senility, Dimentia and Mental Retardation
655	Psychotropic Medication Management or Brief Psychotherapy
656	Comprehensive Psychiatric Evaluation and Treatment Age > 17
657	Comprehensive Psychiatric Evaluation and Treatment Age 0-17
658	Family Psychotherapy
659	Group Psychotherapy

Alcohol and Drug Abuse

664	Comprehensive Therapy for Drug Abuse with Mental Illness
667	Comprehensive Therapy for Drug Abuse Without Mental Illness
668	Medication Management or Brief Psychotherapy for Drug Abuse
669	Family Therapy for Drug Abuse
670	Group Therapy for Drug Abuse

Neonate

676	Neonate and Congenital Anomalies

Maternal Peripartum Care

691	Routine Prenatal Care
692	Maternal Antepartum Complications
693	Routine Postpartum Care
694	Maternal Postpartum Complications

Infectious Diseases

721	Systemic Infectious Diseases
723	Sexually Transmitted Diseases in Males
724	Sexually Transmitted Diseases in Females

Nervous

736	TIA, CVA and other Cerebrovascular Events
737	Headache
738	Other CNS Diseases

Ophthalmology

751	Cataracts
752	Refraction Disorders
753	Conjunctivitis and Other Simple External Eye Inflamations
754	Other Diseases of the Eye

Ear, Nose, Throat and Mouth

766	Dental Diseases
767	Acute Infectious ENT Diseases age > 17
768	Acute Infectious ENT Diseases age 0-17
769	Acute Non Infectious ENT Diseases
771	Hearing Loss
772	Other ENT Diseases

Respiratory

781	Emphysema, Chronic Bronchitis and Asthma age > 17
782	Emphysema, Chronic Bronchitis and Asthma age 0-17
783	Pneumonia
784	Other Respiratory Diseases

Cardiovascular

796	Congestive Heart Failure and Ischemic Heart Disease
797	Hypertension
800	Other Cardiovascular Disease

Digestive

811	Non Infectious Gastroenteritis
812	Ulcers, Gastritis and Esophagitis
813	Functional Gastrointestinal Disease and Irritable Bowel Syndrome
814	Hepatobiliary Diseases
816	Hemorrhoids and Other Anal Rectal Diseases
817	Other Gastrointestinal Diseases

Signs, Symptoms and Findings

827	Major Sign, Symptoms or Findings

Musculoskeletal

841	Back Disorders
842	Other Musculoskeletal Diseases

Skin

856	Disease of Nails
857	Chronic Skin Ulcers
858	Cellulitis, Impetigo and Lymphangitis
859	Breast Diseases

860	Other Skin and Soft Tissue Diseases

Endocrine and Metabolic

871	Diabetes
872	Obesity
873	Other Endocrine Nutritional and Metabolic Diseases

Urinary

886	Urinary Tract Infections
887	Renal Failure
888	Other Urinary Diseases

Male Reproductive

901	Benign Prostatic Hypertrophy
902	Other Male Reproductive Diseases

Female Reproductive

916	Female Gynecologic Diseases

Immunologic

932	AIDS related Complex and HIV with complications
933	Other Immunologic and Hematologic Diseases

Well Care and Administrative

946	Adult Medical Examination
947	Well Child Care
948	Counselling
949	Contraception and Procreative Management
950	Repeat Prescription
951	Non Specific Signs and Symptoms and Other Contacts with Health Services

Admitted or Died

959	Admitted or Died

Error APGs

495	Inpatient procedures
521	Not applicable procedure
961	No APG Assigned, Procedure or Ancillary Required
976	No APG Assigned
977	Ungroupable

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